

**REMARKS**

Applicants respectfully request reconsideration and allowance of claims 1-37, 38-45, 66-94, 95-100, and 121-124 that are pending in the above-identified patent application.

Applicants acknowledge with appreciation that in Part 8 of the Office Action, the Examiner deemed claims 5, 10-27, 30-37, 71-83, and 87-94 as containing patentable subject matter. In view of the remarks below, however, Applicants respectfully request reconsideration and allowance of the remaining claims.

**§102 REJECTIONS**

In numbered Parts 3-4 of the Office Action, the Examiner rejected 1-3, 6-9, 28, 29, 38-40, 42-45, 66-70, 84-86, 95-100, and 121-124 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,182,930 (“the Blackmer reference”). Applicants respectfully traverse the Examiner’s rejection.

**CLAIMS 1-37, 66-94, 121 AND 123**

Independent apparatus claim 1 requires, among other things, “a wave-shaping circuit operable to receive the square wave signal and to attenuate frequencies substantially outside the third range to produce a second intermediate signal containing sinusoidal signal components from among frequencies corresponding to the respective fundamental frequencies of the square wave signal components;... and a voltage controlled amplifier operable to amplify the second intermediate signal by an amount proportional to the RMS signal to produce a sub-harmonic signal.”

Independent apparatus claim 121 requires “a wave-shaping circuit operable to receive the square wave signal and to at least partially attenuate frequencies substantially outside the third range from the square wave signal to produce an intermediate signal containing sinusoidal signal components based on the square wave signal; and a voltage controlled amplifier operable to amplify the intermediate signal by an amount proportional to an instantaneous amplitude of the signal to produce a sub-harmonic signal.”

Independent method claim 66 requires, among other things, “producing a second intermediate signal from the square wave signal at least partially by attenuating frequencies of the

square wave signal substantially outside the third range such that the second intermediate signal contains sinusoidal signal components from among frequencies corresponding to the respective fundamental frequencies of the square wave signal components;... and amplifying the second intermediate signal by an amount proportional to the RMS signal to produce the sub-harmonic signal.”

Independent method claim 123 requires “producing an intermediate signal that contains sinusoidal signal components based on the square wave signal at least partially by attenuating frequencies of the square wave signal substantially outside the third range; [and] amplifying the intermediate signal by an amount proportional to an instantaneous amplitude of the signal to produce the sub-harmonic signal.”

Applicants respectfully submit that the Blackmer reference fails to disclose or suggest the above-quoted features of each of independent claims 1, 66, 121, or 123.

The Examiner has maintained the same reasoning as in the prior office action as to the teachings of the Blackmer reference. At pages 3 and 7-8 of the Office Action, the Examiner takes the position that the Blackmer reference discloses “a wave-shaping circuit operable to receive the square wave signal and to produce a second intermediate signal containing sinusoidal signal components from among frequencies corresponding to the respective fundamental frequencies of the square wave signal components (FIG. 6G)...” In its May 24, 2005 Response, Applicants argued that the Examiner's reasoning on this point was flawed. In particular, Applicants cited Column 7, lines 4-54; Column 14, line 47 – Column 15, line 25; and FIG. 4 in making the point that the Blackmer reference seeks to preserve the frequency content of the output of the band-pass filter 12 within the signal 232 (which is the signal in FIG. 6G) produced by the double balanced modulator 184. In other words, by using the square wave signal on line 204 to modulate (gate and invert) the output from of the band-pass filter 12 to produce the signal 232, such signal contains frequencies substantially outside of the sub-harmonic frequency range – i.e., such frequencies of the signal input to the zero crossing detector 182.

The Examiner's remarks in the pending Office Action at page 2 indicate that he either does not agree with Applicants' analysis or does not fully appreciate the implications of the teachings of the Blackmer reference. In any event, Applicants have amended independent claims 1, 66, 121, and 123 to specifically recite that the claimed wave shaping circuit or step attenuates frequencies substantially outside the sub-harmonic frequency range from the square wave signal to produce the

intermediate signal containing sinusoidal signal components based on the square wave signal. As the Blackemer reference fails to teach this feature – and indeed teaches precisely the opposite – Applicants respectfully submit that the Blackmer reference fails to disclose or suggest all of the features of independent claims 1, 66, 121, or 123. Further, the claims dependent on these independent claims contain all of the respective limitations thereof as well as other limitations that are neither disclosed nor suggested by the prior art of record. Accordingly, Applicants submit that claims 1-37, 66-94, 121, and 123 are patentable over the Blackmer reference.

#### **CLAIMS 38-45, 95-100, 122 AND 124**

Independent claim 38 requires “at least one band-pass filter operable to receive the input signal and to produce a second intermediate signal containing frequencies from among a fourth range,...; an amplifier operable to increase an amplitude of the second intermediate signal to produce a third intermediate signal; and a summation circuit operable to sum the sub-harmonic signal and the third intermediate signal to produce at least a portion of an output signal.”

Independent apparatus claim 122 requires “at least one band-pass filter operable to produce an intermediate signal containing frequencies from among a third range of frequencies including at least some frequencies above the second range of frequencies; and a summation circuit operable to sum the sub-harmonic signal and the intermediate signal to produce at least a portion of an output signal.”

Independent method claim 95 requires “producing a second intermediate signal from the input signal such that it contains frequencies from among a fourth range,...; producing a third intermediate signal by increasing an amplitude of the second intermediate signal; and summing the sub-harmonic signal and the third intermediate signal to produce at least a portion of an output signal.”

Independent method claim 124 requires “producing an intermediate signal that contains frequencies from among a third range of frequencies including at least some frequencies above the second range of frequencies; and summing the sub-harmonic signal and the intermediate signal to produce at least a portion of an output signal.”

Again, the Examiner has maintained the same reasoning as in the prior office action as to the teachings of the Blackmer reference. At pages 5 and 8 of the Office Action, the Examiner takes the position that the “band-pass filter” and producing step implicated by the subject claims are met by

one of the band-pass filters 12A-N and the “summation circuit” and summing step required by the subject claims are met by one or more of the summing resistors 16A-N that are input to the low pass filter 42.

In the May 24, 2005 Response, Applicants pointed out that the Examiner’s analysis was flawed as to his interpretation of the Blackemer reference. In particular, Applicants pointed out that the sub-harmonic signal of the Blackmer reference exists at the input to the low pass filter 42. In other words, resistors 16A-N produced the sub-harmonic signal and, thus, could not possibly sum the sub-harmonic signal with another signal.

The Examiner's remarks in the pending Office Action at page 2 indicate that he considers the output of filter 14B to be the sub-harmonic signal and the output of filter 14A to be another signal "the third intermediate signal" as claimed. Thus, the examiner's position is that a sub-harmonic signal (from filter 14A) is the "third intermediate signal" as claimed. Close scrutiny of the Blackemer reference as compared to the claim language reveals that this position cannot stand. Looking to the language of claim 38, by way of example, the third intermediate signal cannot be a sub-harmonic signal. Indeed, as claimed the third intermediate signal is produced by amplifying a band-pass filtered version of the input signal. This cannot and does not produce a sub-harmonic signal. Subsequently, the claimed sub-harmonic signal and third intermediate signal are summed to produce at least a portion of an output signal. In contrast, the Blackemer reference, however, discloses summing a plurality of sub-harmonic signals output from filters 14A, 14B, 14C . . . 14n. The Blackemer reference fails to disclose that any of the respective sub-harmonic signals from filters 14A, 14B, 14C . . . 14n or the aggregate thereof from the summing resistors 16A, 16B, 16C . . . 16n are summed with a third intermediate signal.

In view of the foregoing, Applicants submit that the Blackmer reference fails to disclose or suggest the above-quoted features of independent claims 38, 95, 122, and 124. Further, the claims dependent on these independent claims contain the respective limitations thereof as well as other limitations that are neither disclosed nor suggested by the prior art of record. Accordingly, Applicants submit that the subject dependent claims are likewise patentable.

## §103 REJECTIONS

In numbered Parts 5-7, the Examiner rejected claims 4 and 41 under 35 U.S.C. § 103(a) as being unpatentable over the Blackmer reference. As discussed above, the Blackmer reference fails

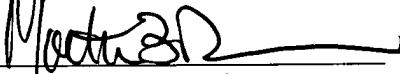
to disclose or suggest each of the features of the respective base claims of dependent claims 4 and 41. Consequently, claims 4 and 41 are patentable over the Blackmer reference.

## CONCLUSION

In view of the foregoing, Applicants submit that the instant claims are in condition for allowance. Early and favorable action is earnestly solicited.

Applicants therefore respectfully request reconsideration and allowance in view of the above remarks and amendments. In the event there are any fees due and owing in connection with this matter, please charge same to our Deposit Account No. 11-0223.

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